

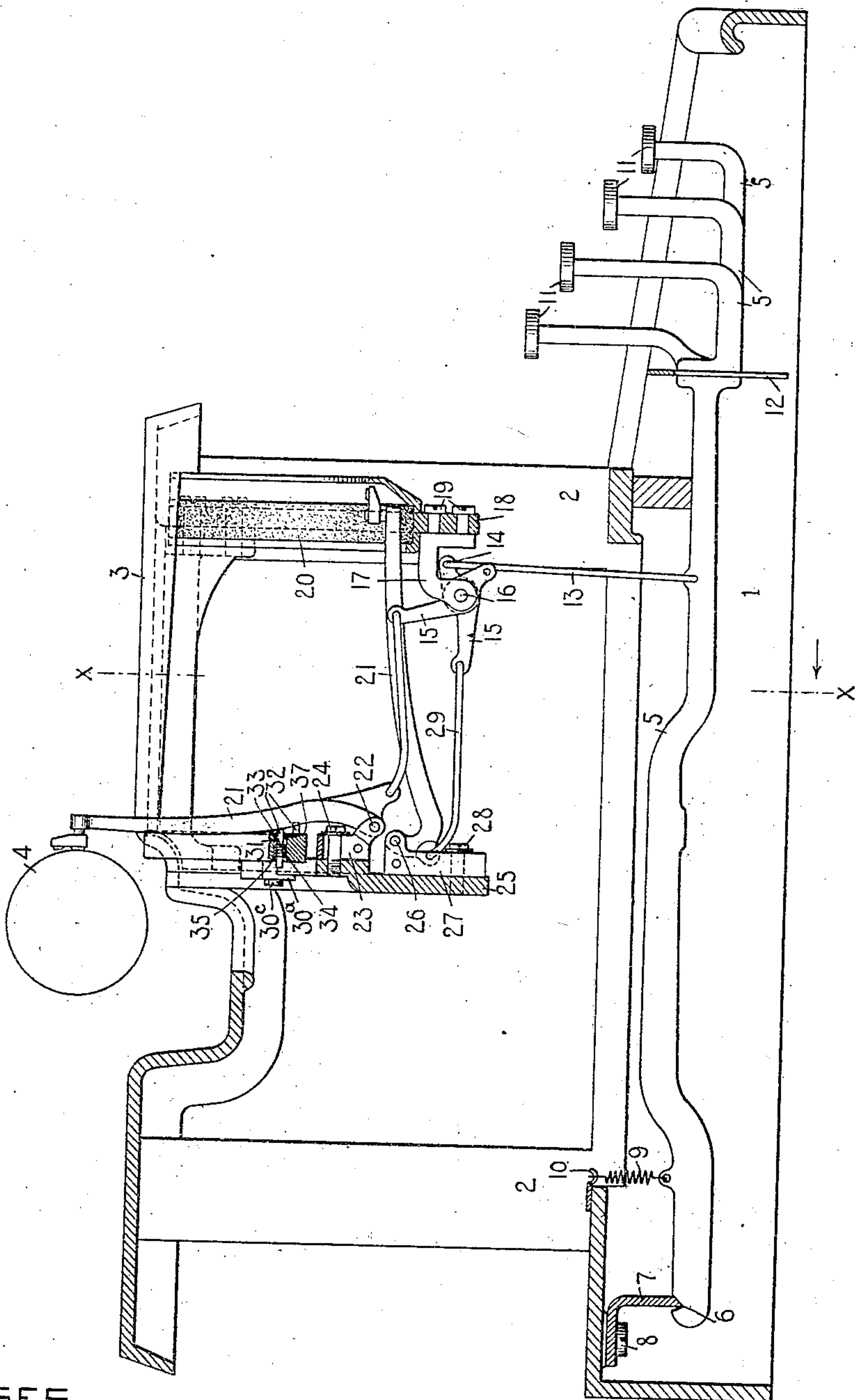
No. 863,890.

PATENTED AUG. 20, 1907.

O. WOODWARD.  
TYPE WRITING MACHINE.  
APPLICATION FILED MAY 10, 1906.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

*J. B. Reeves*  
*Charles E. Smith*

INVENTOR.

*Oscar Woodward*  
By *Jacob Felbel*  
HIS ATTORNEY.

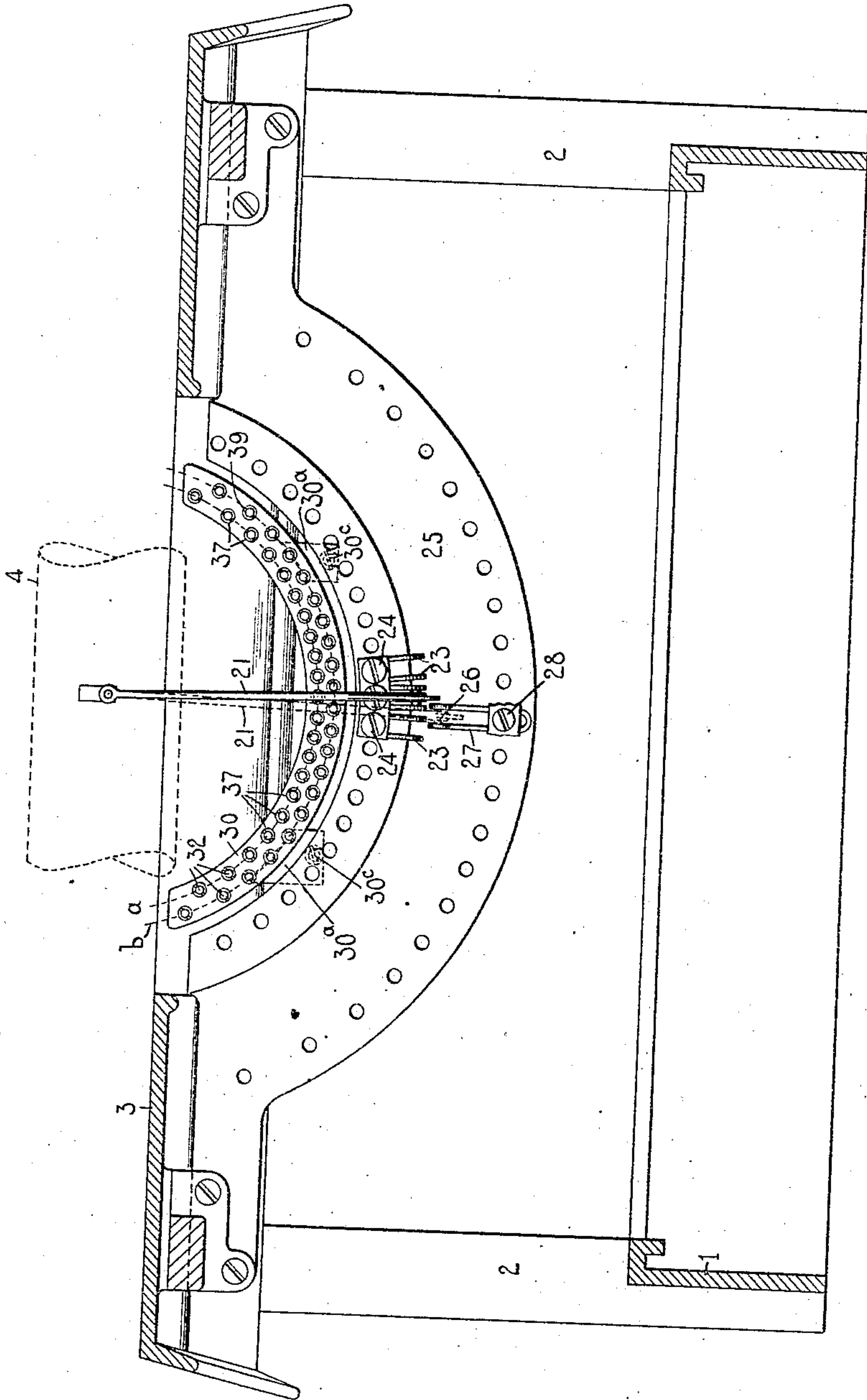
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3 SHEETS—SHEET 2.

FIG. 2.



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3 SHEETS—SHEET 3.

FIG. 3.

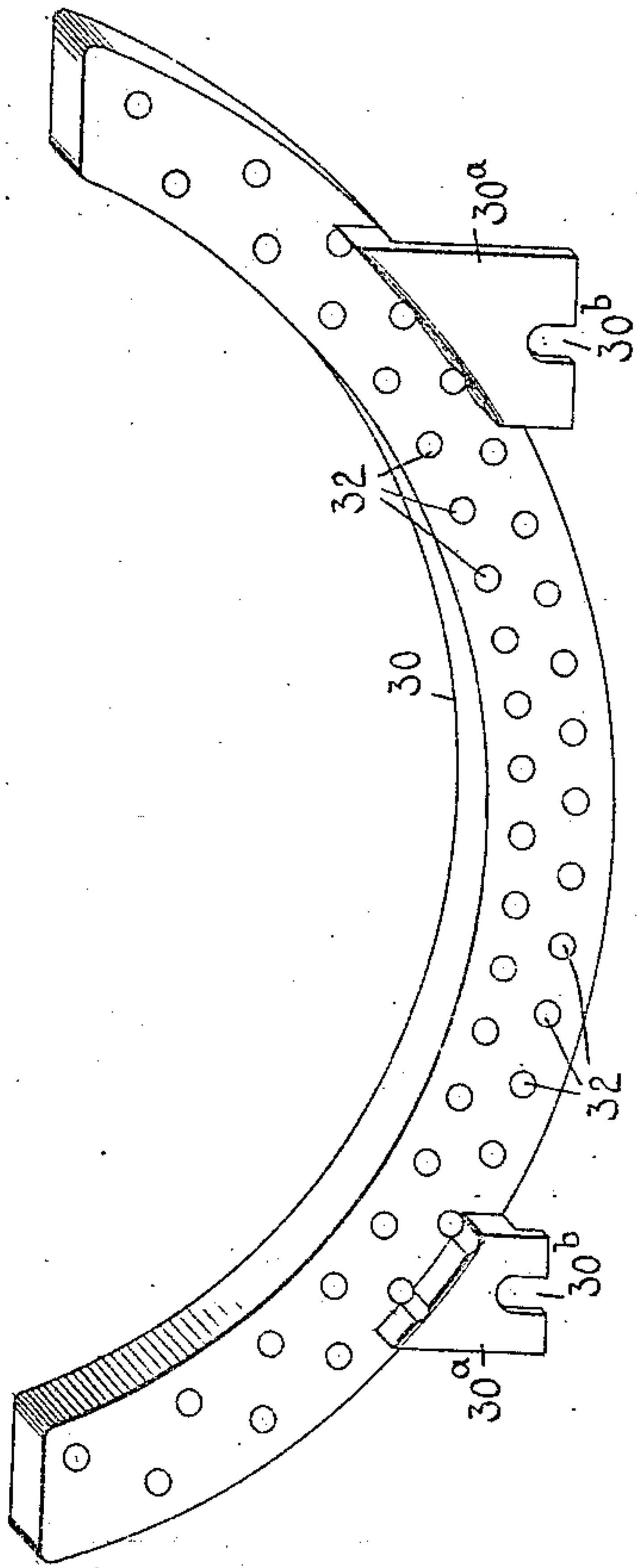
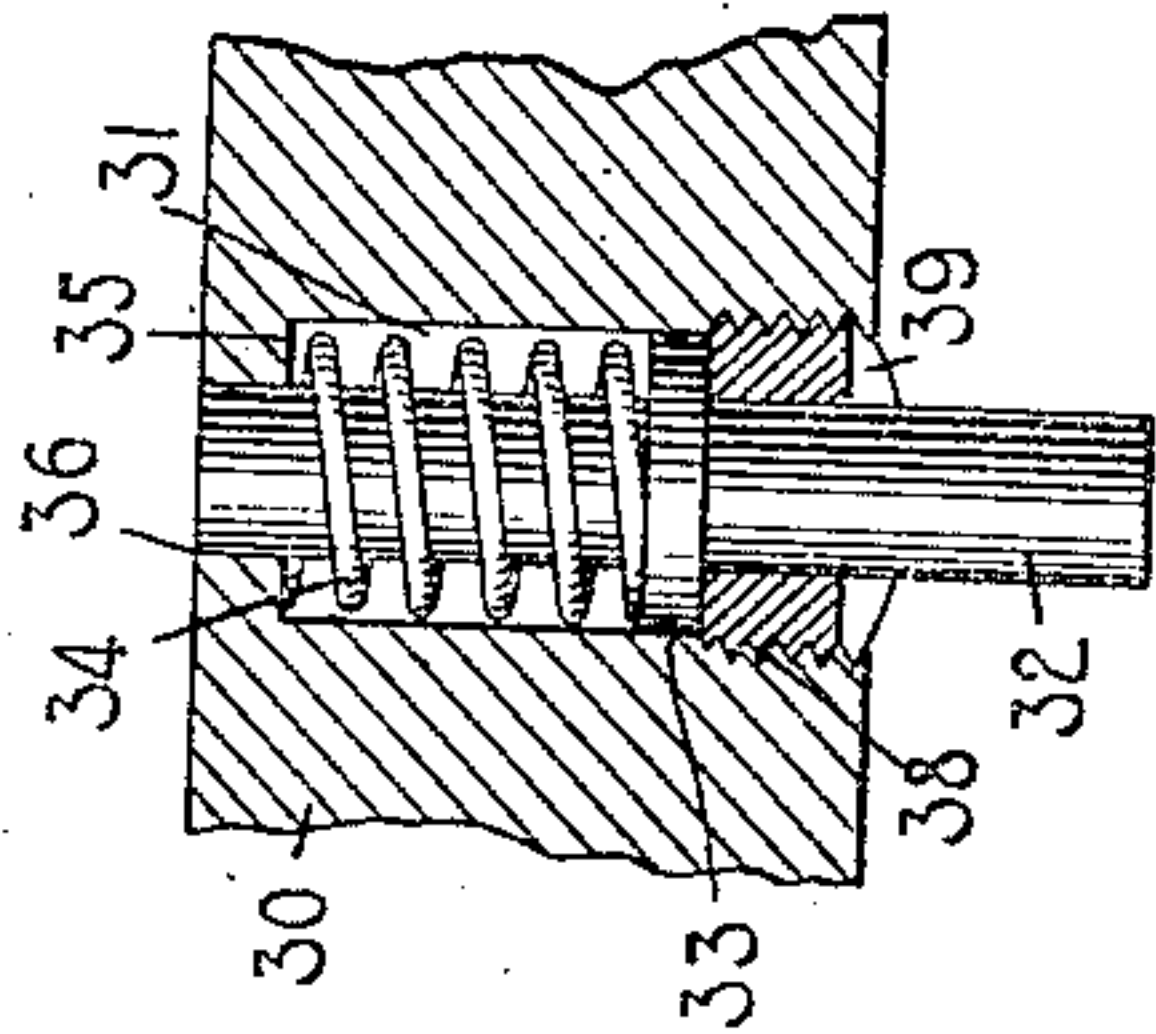


FIG. 4.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

OSCAR WOODWARD, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT,  
OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

No. 863,890.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed May 10, 1906. Serial No. 316,165.

*To all whom it may concern:*

Be it known that I, OSCAR WOODWARD, a citizen of the United States, and a resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to repulsers for causing the type bars to be quickly removed from contact with the platen after each imprint.

The object of my invention is to produce simple and efficient repulser devices of the character specified.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices to be hereinafter described and particularly pointed out in the appended claims.

In the drawings, wherein like reference characters indicate corresponding parts in the different views, Figure 1 is a vertical, front to rear, sectional view of sufficient number of parts of one form of typewriting machine to show my invention in its application thereto. Fig. 2 is a transverse sectional view of the same, with parts omitted, the section being taken on the line  $x-x$  of Fig. 1 and looking in the direction of the arrow at said line. Fig. 3 is a detail rear perspective view showing the support for the various repulsers and the repulsers mounted in place thereon. Fig. 4 is an enlarged detail fragmentary sectional view taken transversely through the support for the repulsers, the section cutting one of the chambers in which a repulser is mounted.

I have shown my invention applied to a "visible" or front-strike typewriting machine wherein it is particularly applicable, but it should be understood that the invention may be employed in various styles of typewriting machines.

The particular machine to which the invention is shown applied in the present instance forms the subject-matter of a separate application filed by me on the 15th day of August, 1905, Serial No. 274,288.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. A carriage (not shown) is mounted above the top plate to travel from side to side of the machine and carries a platen 4 diagrammatically illustrated. Key levers 5 are notched at 6 where they turn on a fulcrum plate 7 secured to the base of the machine by screws 8. Each key lever is provided with a restoring spring 9 connected at one end to the key lever and at its opposite end to a connecting device 10 which is secured to the base of the machine. The key levers are provided with the usual finger keys 11 and are guided at their forward ends in

a comb plate 12. Each key lever is connected to a link 13 which has its upper end connected at 14 to a sub-lever 15 pivoted at 16 to a hanger 17. The various hangers 17 are segmentally arranged and are secured to a segmental support 18 by screws 19. The support 18 has a pad 20 at the upper side thereof which supports the forward ends of upwardly and rearwardly striking, segmentally arranged, type bars 21. The type bars in the present instance are shown as pivoted in two arcs, one above the other. The set of type bars in the highest arc are pivoted at 22 to hangers 23 which are secured by screws 24 to a type bar segment 25. The other set of type bars are pivoted at 26 to hangers 27 secured to the segment 25 by screws 28. Draw links 29 connect the various sub-levers 15 and the type bars 21. A depression of any of the keys 11 will cause the associated type bar to swing upwardly and rearwardly to the printing position as shown in Fig. 1, the type bar impacting against the front face of the platen 4.

The construction thus far described is essentially the same as that shown in my application hereinbefore referred to and further description thereof is deemed unnecessary.

A support 30 which is shown in detail in Fig. 3 is provided with depending lugs 30<sup>a</sup> on the rear side thereof, said lugs being slotted at 30<sup>b</sup> for cooperation with headed screws 30<sup>c</sup> by which the support is connected to the type bar segment 25 as shown in Figs. 1 and 2; the lugs 30<sup>a</sup> extending back of the segment 25 as indicated in Fig. 2. The support 30 is preferably in the nature of an apertured guide formed as a segment with two series of perforations or chambers 31 that extend therethrough fore and aft of the machine. These holes, chambers or openings 31 are arranged in two arcs indicated by the dotted lines  $a$  and  $b$  in Fig. 2. These arcs are struck from the printing point or from a point adjacent to the printing point and the arcs have different radii, and one is situated above the other. A repulser or plunger 32 extends through each opening or chamber 31 and is provided with an enlargement 33 which is contained within the chamber and forms an abutment against which one end of a coiled expansion spring 34 bears, the other end of said spring bearing against the rear wall of the chamber. A contracted opening 36 in the rear wall of each chamber constitutes a guide for the rear end of the associated plunger 32. The forward end of the plunger passes through a central opening in a nut or block 37 which is exteriorly threaded at 38 to cooperate with interior threads in the forward end of the chamber 31. These threaded blocks may be provided with nicks or slots 39 for the reception of a suitable tool by which they may be screwed into position in the chambers 31 to close the forward ends thereof. The tension of each spring 34 is exerted to maintain the forward end



of the associated plunger 32 in its forward position where it projects forward of the front face of the support 30, as shown in Figs. 1 and 4.

From an inspection of Fig. 2 it will be seen that the various plungers move fore and aft of the machine and that the plungers of one series contained within the arc *a* are staggered relatively to the plungers contained in the other arc *b* and that the various repulsers or spring pressed plungers 32 are situated in substantially the same vertical transverse plane and are interposed between the pivots of the type bars and the printing point.

The number of repulsers are preferably equal to the number of type bars employed in the machine so that each type bar coöperates with an independent repulser, and from an inspection of Figs. 1 and 2 it will be understood that adjacent type bars coöperate with plungers or repulsers in the different arcs *a* and *b*.

By staggering the repulsers in the manner indicated and arranging them in arcs of different radii, I am enabled to provide a separate plunger or repulser for each type bar and to situate the repulsers between the pivots of the type bars and the printing point.

In the operation of the machine the depression of the finger key will cause the type bar 21 to be moved upwardly and rearwardly to the printing point and at the last portion of the printing movement the type bar will contact with the forward end of its associated plunger 32, thereby forcing it against the tension of its spring 34 during the remainder of the printing stroke. As soon as pressure is released upon the finger key, or in some cases before the pressure is released, the type bar will be quickly moved by the repulser away from the platen so as to prevent the production or blurring imprints or "ghosts", thus affording a construction which enables clear imprints to be produced at all times and under all conditions.

By employing an independent repulser for each type bar, I am enabled to provide comparatively light repulsers which do not appreciably affect the touch or the printing operation of the type bars; but which are, nevertheless, efficient to prevent the blurring which is sometimes produced when the type bars are not removed from the platen or do not rebound therefrom with sufficient rapidity.

It will be understood that the full momentum of the type bar has been acquired before it reaches contact with its associated repulser and that the action of the repulser on the type bar does not appreciably affect the printing operation except to assure the quick removal or rebound of the type bar from the printing position and from contact with the paper on the platen. Furthermore, the points at which the repulsers coöperate with the type bars enable the repulsers to act with great efficiency. The repulsers not only prevent the production of blurring imprints but assure a quick return of each type bar from the vicinity of the printing point after an imprint has been produced, thereby reducing to a minimum the liability of conflict between adjacent type bars when the machine is rapidly operated.

From an inspection of Fig. 1 it will be understood that the uppermost set of type bars which are pivoted to the hangers 23 coöperate with the repulsers in the upper arc *a*, whereas the type bars of the lower set

which are pivoted at 26 to the hangers 27 coöperate with the repulsers of the lower arc *b* so that the different repulsers coöperate with their respective type bars at substantially the same distance from the pivots thereof in all cases and the action therefore is uniform throughout the system.

Various changes may be made without departing from my invention.

In my aforesaid prior application, I claim the key-lever and type-bar action, the hangers and the segments, and all other novel features herein shown but not claimed.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of segmentally arranged type bars, and a plurality of independent staggered repulsers, one for each type bar, each repulser being operated upon by its associated type bar as the type bar approaches the printing position.

2. In a typewriting machine, the combination of segmentally arranged type bars, and two series of segmentally arranged spring restored repulsers, one for each type bar, the repulsers of one series being arranged in an arc whose radius is greater than the radius of the arc in which the other series of repulsers is situated.

3. In a typewriting machine, the combination of segmentally arranged type bars, and two series of segmentally arranged spring restored repulsers, one for each type bar, the repulsers of one series being arranged in an arc whose radius is greater than the radius of the arc in which the other series of repulsers is situated, the various repulsers of the two series being staggered relatively to each other.

4. In a typewriting machine, the combination of segmentally arranged type bars, and two series of segmentally arranged spring restored repulsers, one for each type bar, the repulsers of one series being arranged in an arc whose radius is greater than the radius of the arc in which the other series of repulsers is situated, and adjacent type bars coöperating with repulsers of the different series.

5. In a typewriting machine, the combination of a plurality of segmentally arranged type bars, and coöperating spring restored repulsers arranged in two arcs of different radii, adjacent type bars coöperating with repulsers in the different arcs and the spring of each repulser being flexed by its associated type bar at the last portion of the printing stroke.

6. In a typewriting machine, the combination of segmentally arranged type bars, plungers arranged in two arcs of different radii, one plunger coöperating with each type bar, and a spring for each plunger, each spring being flexed by its plunger during the movement of the associated type bar to the printing position, adjacent type bars coöperating with plungers in different arcs.

7. In a front-strike typewriting machine, the combination of segmentally arranged upwardly and rearwardly striking type bars, and a plurality of independent spring-pressed plungers which move fore and aft of the machine, each type bar contacting with an associated plunger during the movement of the type bar to the printing position and flexing the spring of said plunger.

8. In a front-strike typewriting machine, the combination of segmentally arranged upwardly and rearwardly striking type bars, and a plurality of independent spring-pressed plungers which move fore and aft of the machine and are arranged in two arcs of different radii, each type bar contacting with an associated plunger during the movement of the type bar to the printing position and flexing the spring of said plunger.

9. In a typewriting machine, the combination of a series of segmentally arranged type bars, a support having a plurality of segmentally arranged holes or chambers formed therein, and a series of spring-pressed plungers received and guided in said chambers and with each of which an associated type bar is adapted to contact in the movement of the bar to the printing position.



10. In a typewriting machine, the combination of a series of segmentally arranged type bars, a support having a plurality of holes or chambers formed therein and arranged in two arcs of different radii, and a series of spring-pressed plungers received and guided in said chambers and with each of which an associated type bar is adapted to contact in the movement of the bar to the printing position.

11. In a front-strike typewriting machine, the combination of a series of segmentally arranged upwardly and rearwardly striking type bars, a support having a plurality of segmentally arranged holes or chambers formed therein and extending fore and aft of the machine, and a series of spring-pressed plungers received and guided in said chambers and moving fore and aft of the machine, each type bar contacting with an associated plunger in the movement of the bar to the printing position.

12. In a front-strike typewriting machine, the combination of a series of segmentally arranged upwardly and rearwardly striking type bars, a support having a plurality of holes or chambers formed therein and extending fore and aft of the machine and arranged in two arcs of different radii, and a series of spring-pressed plungers received and guided in said chambers and moving fore and aft of the machine, each type bar contacting with an associated plunger in the movement of the bars to the printing position.

13. In a front-strike typewriting machine, the combination of a series of segmentally arranged upwardly and rearwardly striking type bars, and a plurality of independent spring-pressed repulsers, one for each of said type bars, the repulsers being arranged in two arcs one above the other, the spring of each of said repulsers being placed under strain by its associated type bar in the movement of the latter to the printing position.

14. In a front-strike typewriting machine, the combination of a series of segmentally arranged upwardly and rearwardly striking type bars; a plurality of independent spring-pressed repulsers arranged in two arcs one above the other, the spring of each of said repulsers being placed under strain by its associated type bar in the movement of the latter to the printing position and each of said repulsers comprising a plunger and a coiled spring surrounding the stem of the plunger; and an apertured guide in which all of said plungers work.

15. In a front-strike typewriting machine, the combination of a series of segmentally arranged upwardly and rearwardly striking type bars, and a series of independent segmentally arranged spring pressed repulsers, one for each of said type bars, said repulsers being arranged in two arcs in the same plane, the arcs situated one above the other, the spring of each of said plungers being placed under strain by its associated type bar in the movement of the latter to the printing position, each of said repulsers comprising a plunger, a chamber in which said plunger works, a coiled spring contained within said chamber and surrounding the stem of said plunger, and a removable perforated block that closes one end of the chamber and receives the stem of the plunger in the perforation in the block.

16. In a typewriting machine, the combination of a series of type bars; and a plurality of spring-pressed repulsers arranged in two arcs of different radii, the spring of each repulser being placed under strain by the associated type bar as the latter approaches the printing position,

each repulser comprising a plunger with which the associated type bar contacts at the last portion of its printing stroke, a guiding chamber in which said plunger works, a coiled spring contained within said guiding chamber and surrounding a portion of the plunger and bearing at one end against the plunger, and a plug with a perforation in which the plunger is received and by which the plunger is guided, said plug being threaded into the guide chamber at one end thereof.

17. In a front-strike typewriting machine, the combination of a series of segmentally arranged upwardly and rearwardly striking type bars, and a series of independent spring pressed repulsers arranged in two arcs one above the other and in substantially the same plane, one repulser being provided for each of said type bars, the spring of each repulser being placed under strain by its associated type bar in the movement of the latter to the printing position, each of said repulsers comprising a plunger that moves fore and aft of the machine and with which the associated type bar contacts at the last portion of its printing stroke, a guiding chamber in which said plunger works, a coiled spring contained within said guiding chamber and surrounding a portion of the plunger and bearing at one end against the plunger, and a plug with a perforation in which the plunger is received and by which the plunger is guided, said plug being threaded into the guide chamber at one end thereof.

18. In a typewriting machine, the combination of a series of segmentally arranged pivoted type bars, and a series of segmentally arranged staggered type bar repulsers situated between the pivots of the type bars and the printing point, each type bar contacting with an independent repulser during the movement of the type bar to the printing position.

19. In a typewriting machine, the combination of a series of segmentally arranged pivoted type bars, a support having a plurality of holes or chambers formed therein and arranged in two arcs of different radii, the chambers in one arc being staggered relatively to the chambers in the other arc, and a series of spring pressed plungers working in said chambers, adjacent type bars contacting with plungers in different arcs as said type bars approach the printing position.

20. In a front-strike typewriting machine, the combination of a series of upwardly and rearwardly striking pivoted type bars, a segment which carries said type bars, a support carried by said segment between the pivots of the type bars and the printing point, a series of holes or chambers formed in said support and extending fore and aft of the machine, said chambers being arranged in two arcs of different radii and the chambers in one arc being staggered relatively to the chambers in the other arc, and a series of spring pressed plungers which work in said chambers and move fore and aft of the machine, each type bar contacting with a separate plunger in the movements of the type bars to the printing position and adjacent type bars cooperating with plungers in different arcs.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 9th day of May, A. D. 1906.

OSCAR WOODWARD.

Witnesses:

E. M. WELLS,

M. F. HANNWEBER.